Southern Sierra Geographic Information Cooperative

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Fuels/Data Management

December 2002
Association for Fire Ecology Conference
San Diego, California

Brent Skaggs
Sequoia NF Deputy Fire Management Officer

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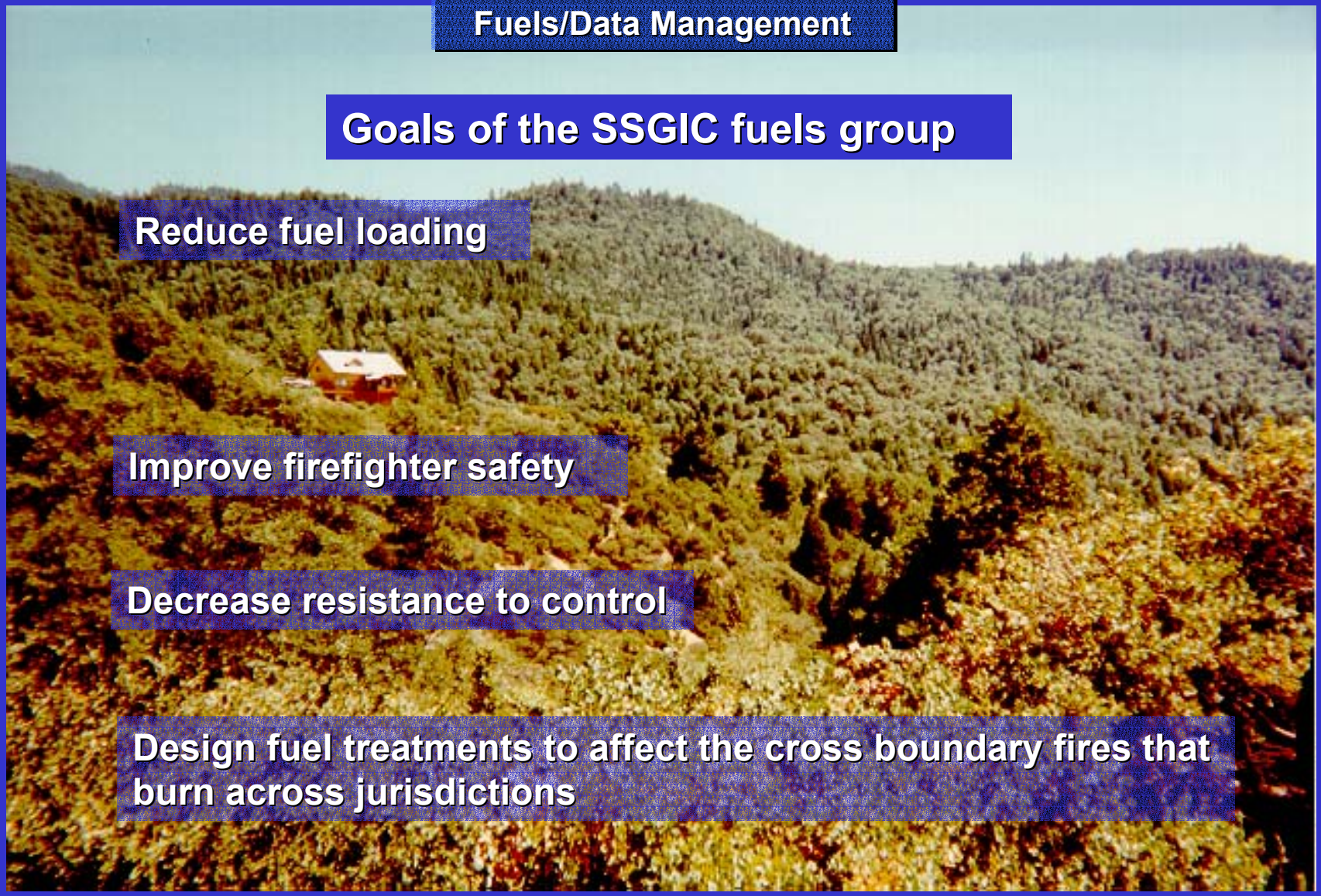

Goals of the SSGIC fuels group

- Reduce fuel loading
- Improve firefighter safety
- Decrease resistance to control
- Design fuel treatments to affect the cross boundary fires that burn across jurisdictions

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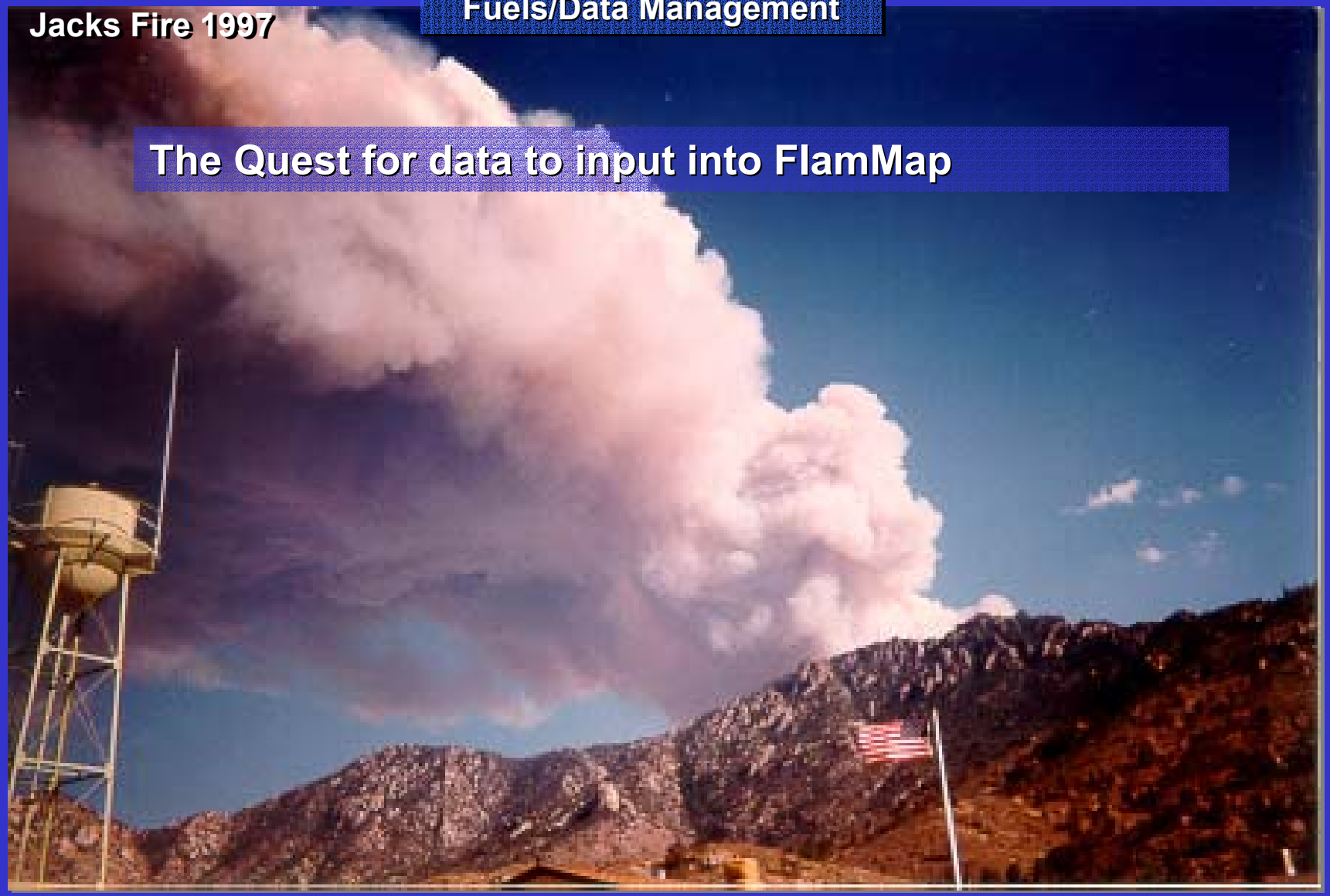

The Quest for data to input into FlamMap

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Jacks Fire 1997

On 12/12/2000 the SSGIC fuels group reviewed the GAP data within the analysis area and drafted a vegetation / fuel model crosswalk.

The group included Corky Conover - SEKI NPS, Tony Caprio - SEKI NPS, David Drum - Tulare County CDF, Heidi Hosler – Sequoia NF, Karen Folger - SEKI NPS, and Brent Skaggs - Sequoia NF

The GAP, Sequoia NF, and SEKI NPS vegetation / fuel model crosswalks were combined to produce the SSGIC Fuel Model map

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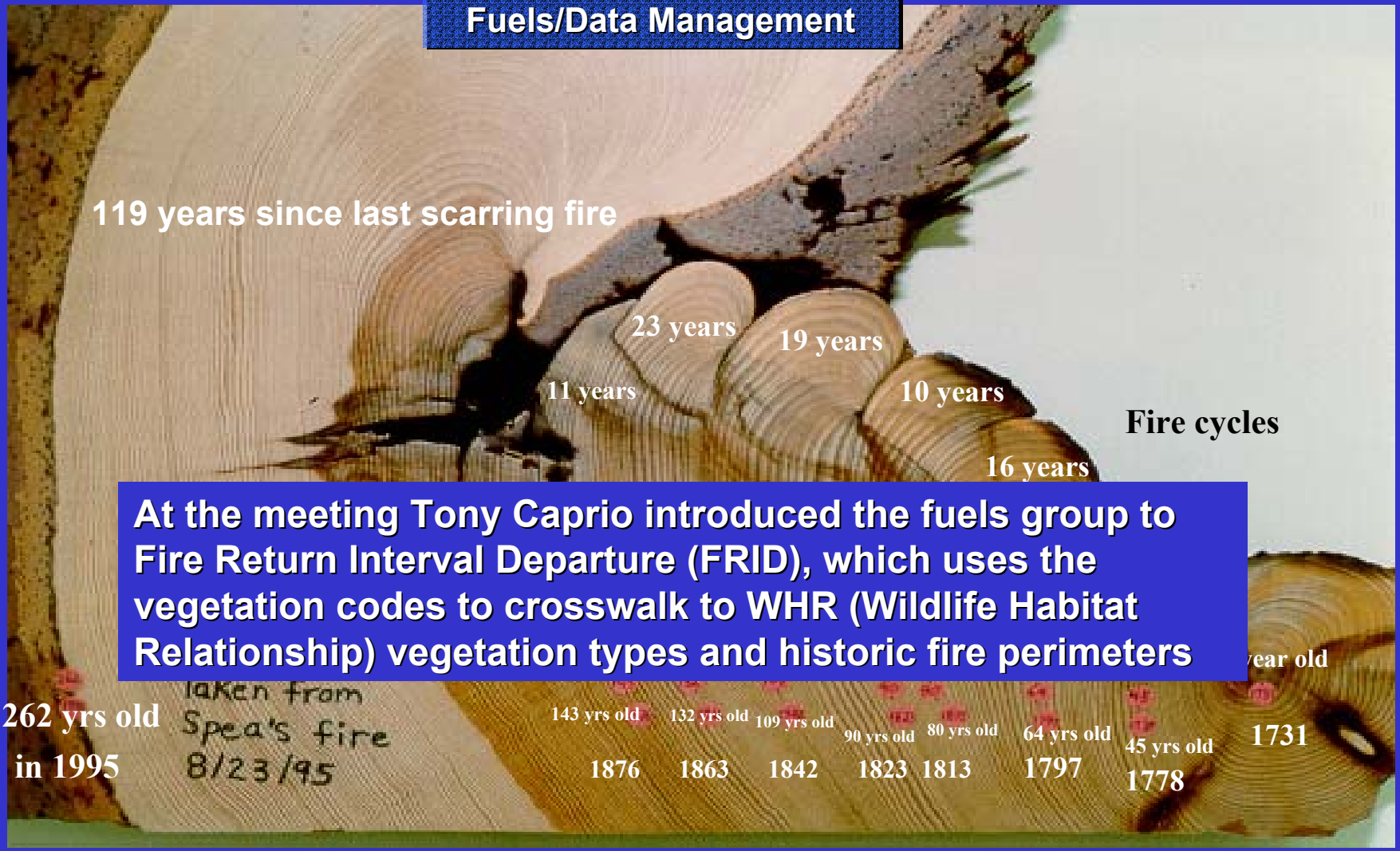

At the meeting Tony Caprio introduced the fuels group to Fire Return Interval Departure (FRID), which uses the vegetation codes to crosswalk to WHR (Wildlife Habitat Relationship) vegetation types and historic fire perimeters

Fuels/Data Management

Develop inputs and run FlamMap

FlamMap – is an analysis that represents the hazard potential for a fire at each location across the landscape

We looked at weather stations in the SSGIC area and mapped their locations.

Corky Conover and I compared several weather stations using the Fire Family Plus software to determine if we needed to define multiple weather influence zones

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Develop inputs and run FlamMap

There were twenty-five weather stations in the SSGIC area, we used data quality and a twenty-year weather data requirement to narrow the number Wx stations to eight

From North to South the eight stations were Ash Mountain, Park Ridge, Pinehurst, Oak Opening, Blackrock, Hot Springs, Kernville, and Democrat

In consultation with Don Carlton (Fire Program Solutions), we decided to select one weather station and a single weather influence zone.

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Develop inputs and run FlamMap

Out of the eight stations the Ash Mountain weather station data best represented the low to extreme Wx indices

An option to explore at a later date is to consult with a Fire Weather Meteorologists, and use GIS and the existing fire danger rating areas to determine the need for additional weather influence zones

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FireFamily Plus Percentile Weather Report for RERAP

Station: 044701: ASH MOUNTAIN **Variable: SC** **Model: 7G3AD2**

Data Years: 1981 – 2000 **Date Range: May 1 - October 31**

Wind Directions: N, NE, E, SE, S, SW, W, NW

Percentiles, Probabilities, and Mid-Points

Variable/Component Range		Low	Mod	High	Ext
Percentile Range		0 - 15	16 - 89	90 - 97	98 - 100
Climatol. Probability		15	75	7	3
Mid-Point	SC	6 - 6	15 - 15	21 - 21	25 - 99
Num Observations		114	249	104	52
Calculated Spread Comp.		6	15	21	27
Calculated ERC		35	69	77	77
Fuel Moistures	1 Hour Fuel Moisture	7.10	4.20	3.60	3.30
	10 Hour Fuel Moisture	9.70	5.80	5.40	4.70
	100 Hour Fuel Moisture	13.10	8.00	6.60	6.40
	Herbaceous Fuel Moisture	105.20	6.40	4.00	3.30
	Woody Fuel Moisture	129.20	70.20	58.80	60.50
	20' Wind Speed	5.40	8.30	11.00	14.10
1000 Hour Fuel Moisture		16.40	9.20	7.80	8.00

3162 Weather Records Used, 3146 Days With Wind (99.49%)

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Develop inputs and run FlamMap

To run FlamMap the SSGIC needed a custom fuel file (.fmd), we contacted Dave Sapsis (Wildland Fire Scientist CDF). Dave sent us an .fmd file containing custom fuel model(s) 15 (desert similar to model 2) and fuel model 28 (urban that is a fuel model 10 with houses) In addition to the standard 1-13 NFFL fuel model(s) we had three non-burning models 97 Cropland , 98 Lake, and 99 Barren

The FlamMap input for wind speed and fuel moisture came from each of the four percentile weather categories produced by the Fire Family Plus software

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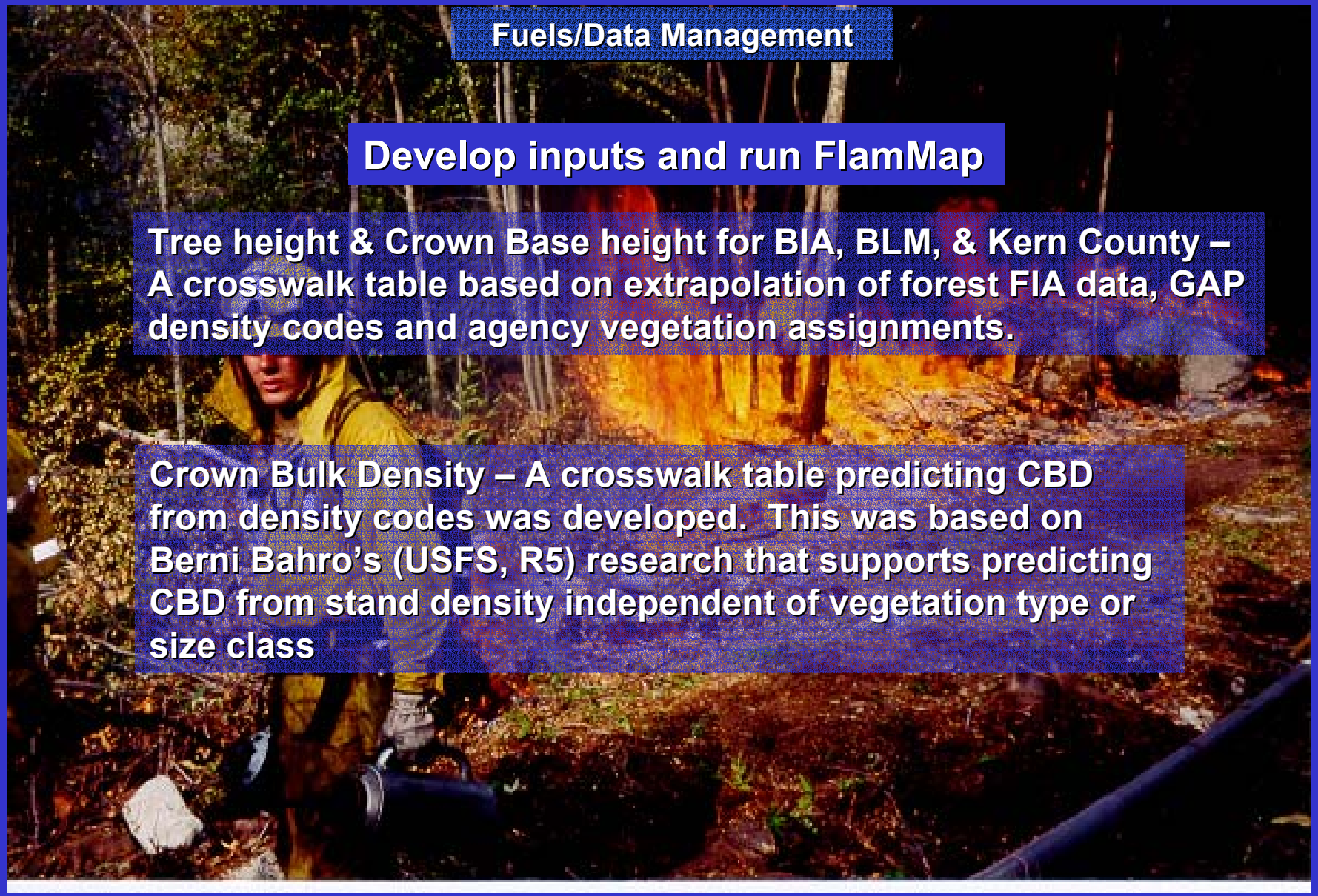
Develop inputs and run FlamMap

The optional canopy characteristics for FlamMap include:

Tree Height & Crown Base height - Source data integrated into these datasets include:

National Forests – A crosswalk table based on Forest Inventory and Analysis (FIA) data linked to forest CalVeg strata

Sequoia and Kings Canyon National Park – existing spatial tree height data & height to understory data for crown base height determination



Fuels/Data Management

Develop inputs and run FlamMap

Tree height & Crown Base height for BIA, BLM, & Kern County – A crosswalk table based on extrapolation of forest FIA data, GAP density codes and agency vegetation assignments.

Crown Bulk Density – A crosswalk table predicting CBD from density codes was developed. This was based on Berni Bahro's (USFS, R5) research that supports predicting CBD from stand density independent of vegetation type or size class

Fuels/Data Management

Develop inputs and run FlamMap

Tree height BIA, BLM, & Kern County – A crosswalk table based on extrapolation of forest FIA data, GAP density codes, and agency vegetation assignments. Interpretation was done by fire management subject matter specialist

Crown Base height - Source data integrated into this dataset include:

National Forests – A crosswalk table based on Forest Inventory and Analysis (FIA) data linked to forest CalVeg strata

Develop inputs and run FlamMap

This Xwalk table was used to assign the 3 Flammap optional canopy layers to theSSGIC data.

SQF NF	SSGIC	Crown Bulk Density	Tree Height	Crown Base Height	
USFS_XWALK	XWALK2	NFS_CBD	NFS_TH_FT	NFS_CH_FT	
AX	AX____	0	8	2	
BA	BA____	0	0	0	
BR		0	0	0	
BS	BS____	0.1	4	1	
BT0X	BT_0_X	0	1	1	
BT1X	BT_1_X	0.1	5	1	
BT22		0.12	30	5	
BT26	BT_2_6	0.2	30	5	
BT27	BT_2_7	0.25	30	5	
BT28	BT_2_8	0.25	30	5	
BT29	BT_2_9	0.275	30	5	
BT2X	BT_2_X	0.1	30	5	
BT32		0.12	90	8	
BT34	BT_3_4	0.14	90	8	
BT36	BT_3_6	0.2	90	8	
BT37	BT_3_7	0.25	90	8	
BT38	BT_3_8	0.25	90	8	
BT3X		0.11	90	8	
BT43	BT_4_3	0.13	190	50	
BT44	BT_4_4	0.14	190	50	
BT45	BT_4_5	0.15	190	50	
BT46	BT_4_6	0.2	190	50	
BT47	BT_4_7	0.25	190	50	
BT48	BT_4_8	0.25	190	50	
BT49	BT_4_9	0.275	190	50	
BT52	BT_5_2	0.12	240	80	

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